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Abstract

Using various indicators of financial development, this paper investigates the role of financial intermediation in stimulating economic growth for members of the Southern African Development Community (SADC). The results lend some support to the hypothesis that financial development is positively correlated with the growth rate of real per capita GDP. This relationship is more evident in regressions that use pooled data (5-year cross sections) than those using annual data. This finding suggests that the finance-growth nexus is a long-run phenomenon. The data indicate that while Botswana and Mauritius are catching up with South Africa towards a high-income steady state, the rest of the countries are stagnating to low income levels and low growth rates.

Keywords: Financial Intermediation, Development, Africa, SADC.

JEL Classification: E4, G2, O1

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1. Introduction

Schumpeter observed some 80 years ago that financial markets play a significant role in the growth of the real economy by channeling funds from savers to borrowers in an efficient way to facilitate investment in physical capital and spur innovation and the creative destruction process. Schumpeter's prediction has been widely supported by recent empirical research. For example, King and Levine (1993a) find evidence that supports the view that the level of financial development is a predictor of future economic development and future productivity improvements. Also, the effectiveness of economic policy is positively associated with how well financial markets work.

The data on SADC countries reveal wide disparities in economic performance over the past decades. While the majority of these countries have performed poorly,[1] Botswana and Mauritius have experienced steady growth and are now converging to high income levels, thereby catching up with South Africa. This "mini convergence club"[2] also shows strong signs of development of their financial systems supported by fast growing capital markets. In a recent International Monetary Fund (IMF) Occasional Paper, Mehran, et al. (1998) rank the financial sectors of South Africa, Botswana, and Mauritius consistently in the upper and middle levels of development, while the rest are underdeveloped. South Africa, appropriately, has responsibility for the Finance and Investment Sector of SADC and the potential for accelerated development for other members appears real.

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1 Poor economic performance of African countries has been documented in many studies. Collier and Gunning (1999) provided an excellent survey of the recent literature on this topic.

2 The expression "convergence club" was suggested by Baumol to express the pattern of convergence among countries with similar technological and institutional settings.

Echoing the growing interest in the impact of finance on economic growth, this paper examines the role that financial intermediation has played in explaining disparities in economic outcomes in the southern African region. We motivate and estimate an econometric model that relates economic growth to indicators of financial development. Following standard practice in empirical growth literature, we control for other factors of economic growth such as inflation, government consumption, openness, and debt service.

This study takes advantage of the findings in recent growth studies that emphasize the importance of using panel data analysis in examining cross-country growth dynamics (see Islam 1995; Durlauf and Quah 1998; Temple 1999). We compare the results obtained using three different techniques: simple OLS regressions (forcing a common intercept for all countries), regressions including country-specific fixed effects, and regressions including a high-income dummy. We alternatively use annual data and pooled data.

The rest of the paper is organized as follows: Section 2 discusses the issues in finance and growth addressed in the literature and the stylized facts about inflation and growth. Section 3 provides some background and comparisons among the SADC countries. Section 4 discusses the data. Section 5 presents the methodology and the results of the econometric analysis. Section 6 concludes.

2. Finance and growth: Issues and stylized facts

2.1 Finance and growth

Evidence in recent macroeconomic and economic development literature supports the view that finance is essential for economic growth.[3] Researchers have recently

3 see Levine (1997) for a recent review of the literature.

focused on exploring the channels through which financial development stimulates economic growth. Most studies conclude that financial development enhances efficiency in the allocation of resources, thus stimulating the growth process. Many arguments are proposed in support of the efficiency-enhancing role of the financial system. One argument is that the financial system reduces liquidity risk and facilitates the management of risk by savers and investors. Financial intermediaries evolve to channel saving into long-term assets that are more productive than short-term assets (Bencivenga and Smith, 1991). The financial system facilitates portfolio diversification for savers and investors. As the financial system develops, more choices are offered to investors, allowing them to allocate resources in more productive activities (Demergüç-Kunt and Maksimovic, 1996; Greenwood and Jovanovic, 1990). In economies with unsophisticated financial systems, there are fewer investment opportunities, implying a higher probability that resources are wasted on unproductive uses.

Another argument is centered on the role of the financial system in collecting and processing information about investment projects (Berthélémy and Varoudakis, 1994; King and Levine, 1993b; Boyd and Prescott, 1986). Financial systems collect and evaluate information more effectively and less expensively than individual investors because of the economies of scale enjoyed by financial intermediaries. As a result, the overall cost of investment declines, which stimulates economic growth. A corollary to this argument is that low financial development or distortions in the financial system increase the cost of investment and thus retard economic growth.

2.2 Inflation, finance and growth

Recent research has provided evidence on the view that inflation is detrimental to

long-run economic growth. This evidence challenges the classical view that inflation is positively correlated with capital accumulation (the Mundell-Tobin effect). Mundell (1965) and Tobin (1965) argued that, under the assumption that money and capital are substitutes, a rise in inflation increases the cost of holding money and induces a portfolio shift from money to capital. The premise of this argument is that inflation encourages saving, reducing the interest rate, which results in higher investment and growth. In contrast to this classical view, a number of recent studies demonstrate that inflation acts as a tax on investment, which increases the effective costs of investment (De Gregorio, 1993, 1996; Jones and Manuelli, 1993; Fischer, 1993; Stockman, 1981).[4] Therefore, high inflation is associated with low investment (and saving), thus low economic growth.

Inflation is a constraint on growth because it increases uncertainty about the macroeconomic environment, which disrupts investment and saving decisions. In fact, as Fischer (1993, 1991) suggests, high inflation is evidence of ineffectual macroeconomic policy. Economists identify two channels in which uncertainty can affect growth (Fischer, 1993, p. 488). First, a classical view is that high uncertainty due to bad macroeconomic policy reduces the efficiency of the price mechanism. This disrupts economic decision-making and slows down productivity growth. Secondly, macroeconomic uncertainty is associated with low investment as investors wait for its resolution if it is perceived (correctly or incorrectly) as temporary (Pindyck and Solimano, 1993). Also, Fischer (1993) suggests that uncertainty reduces domestic investment and growth by inducing capital flight.

An important channel of the negative effects of inflation on growth that has

4 See De Gregorio (1996), Fischer (1993) and Orphanides and Solow (1990) for more references on this

received relatively little attention in the literature is the effect of inflation on financial markets. Recent studies have expanded the work by McKinnon (1973) and Shaw (1973) who emphasized the importance of price stability as a necessary condition for financial intermediaries to evolve in the development process. Inflation disrupts financial intermediation by discouraging long-term contracting, by exacerbating informational problems, and by increasing moral hazard problems in the banking sector (McKinnon, 1991). Therefore, high uncertainty makes the financial system both more inefficient in allocating resources (risky lending) and more fragile (high default risk). By creating uncertainty, high inflation disrupts the maturity transformation role of the financial system, thus limiting long-term investment and the growth process.

3. Background to SADC

The Southern African Development Community (SADC) evolved out of a perceived need to limit the economic dependence of the frontline states on apartheid-era South Africa. The SADC has grown to include South Africa, Mauritius, the Democratic Republic of Congo, and the Seychelles[5] in a fourteen-member regional integrated trade group; the others are Angola, Botswana, Lesotho, Malawi, Mauritius Mozambique, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe. All but the island nations of Mauritius and the Seychelles lie in the southern cone of Africa. The Community exceeds the size of the United States physically, with half the population, and holds a significant portion of the world reserves in minerals, precious and base metals, and arable land.

The diversity of the economic and political experiences of this regional cooperative lends itself to an analysis of the variation of growth experiences over time.

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topic.

The region includes both the poorest and the richest African nations, with regional and national income disparities representing the best and the worst (see Table 1). Individual countries have fared differently within the region (see Table 2). Devastated by wars,[6] political instability, droughts, bad economic policy, and other internal and external constraints, many member countries have endured harsh economic conditions. However, countries with more stable political and macroeconomic environment like Botswana and Mauritius have enjoyed remarkable economic progress over the last decades. Botswana and Mauritius stand out as counter examples to the usual perception of stagnant African economies. Post colonial Angola and Mozambique, on the other hand, plagued by internal and external armed conflicts, have had significant stagnation over the last two decades. Whereas petroleum and diamond exports have kept Angola's economy from the bottom, Mozambique made the list of poorest nations. Some countries without major disruptions due to military conflict succumbed to the debt trap and inflationary regimes of the 1980s.

The 1990s have ushered in an era of increased multi-party democracies and international pressure is forcing the liberalization of the economies and a reduction in state control of the economies. Original dominant political figures of the liberation years of the 1960s are relinquishing power to a broader base. South Africa, the most industrialized economy in the region, is in the process of privatizing large state owned enterprises. Unfortunately, in this period of transition, it is very difficult to detect differences in trend. Optimism at the growth potential of the region will require a few

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5 Congo and the Seychelles became members in 1998 and are not included in this analysis.

6.Over the last two decades 5 of the 11 mainland countries experienced armed conflicts: Angola, Mozambique, Namibia, South Africa and Zimbabwe.

more years to confirm empirically.

4. Data and highlights

4.1 Data sources

The most formidable challenge in testing development hypotheses is the availability of data. Macroeconomic time series are generally sparse and when available, they are typically annual. Ideally, to test the effect of policy on growth one would like to have both a long time series as well as a reasonably uniform cross-section of data. A study on a region such as the SADC presents special difficulties in that consistent data are available only after these countries became independent national entities, which dates back to the mid-1960s up until 1990 for Namibia. Furthermore, countries like Angola and Mozambique were only recently included as signatories to the Bretton-Woods international organizations of the IMF and the World Bank and therefore time series data for these two countries are even sparser.

The primary data source for this study is the World Bank's *World Development Indicators 1998*. This contains some 500 series for over 200 countries. The regression sample includes only eight countries with consistent information on the variables of interest: Botswana, Lesotho, Mauritius, Malawi, Swaziland, South Africa, Zambia, and Zimbabwe. Due to missing data in earlier years, the regression sample runs from 1970 to 1996. After the computation of lags, the data included in the regressions are from 1972 to 1996. Data on capital market development are from the reports of the 1997 and 1998 "Southern Africa Economic Summit" prepared by the SADC Finance and Investment Sector Coordinating Unit (SADC-FISCU).[7] Information on stock markets is not used in

7 The SADC-FISCU reports are available on the web site of the Department of Finance of South Africa.

the regressions because the available time series are too short for most of the countries in the group.

4.2 Highlights from the data

Diversity in economic performance

The SADC region is characterized by a wide diversity of income levels (Table 1). The region includes countries with per capita income over $3000 like Botswana, Mauritius, and South Africa as well as those with record low incomes, like Malawi ($180), Mozambique ($80), and Tanzania ($170). For the last decades, income has increased for many of the countries in the region. Botswana has experienced a remarkably steady growth of per capita income from $140 in 1970 to $3210 in 1995. At the same time, dismal records were observed in Angola, Mozambique, Tanzania, and Zambia. On average, the middle of the 1980s was marked by a noticeable downturn in income for the group (as illustrated in Figure 1), following a peak around 1981. Since then, average income has resumed its upward trend.

The general picture exhibits rising inflation, low (and often negative) GDP growth (Table 2), and stagnating investment rates. Diversity is evident across the region on these fronts as well. The level of inflation is particularly high in Angola (with a record 4-digit average inflation rate from 1990 to 1996), Mozambique, Tanzania and Zambia. There are signs that these countries are making progress in policies aimed at controlling inflation (SADC-FISCU, 1998), but sustained effort will be necessary on this front in many more years to come.

The data in Table 3 shows no clear trend in domestic investment for most of the countries in the group. Investment rates are either slightly declining (like in South Africa

and Zambia) or stagnating. Lesotho and Mozambique are the exception with remarkably high and increasing investment rates. In terms of the size of the financial system as measured by liquid liabilities (M3), Mauritius and South Africa have a clear lead over the rest of the sample, with rates above 50 percent of GDP. More evidence of this dominance of South Africa and Mauritius in the area of financial development appears in Table 4 that gives data on stock market development. The newer capital markets have grown faster than the more integrated one in South Africa. Ranked 17th in the world in terms of market capitalization (SADC-FISCU, 1998), the South African stock market will be a major player in the integration of capital markets in the region in the future.

Mini convergence club

Although South Africa is still the dominant player in the region, Botswana and Mauritius are gradually catching up. It appears that these three countries are separating themselves from the pack and converging to a high-income steady state (Figure 2). The rest of the members are either stagnating below the mean relative income (Swaziland and Zimbabwe) or sliding to even lower levels of income (Zambia and Malawi).

This bi-polar trend of income implies a growing dispersion of income. Figure 3 shows the evolution of the coefficient of variation of per capita GNP and per capita GDP defined as the ratio of the standard deviation to the sample mean for each of these indicators (in logarithm). Until the end of the 1970s, dispersion in income was declining. But it has been increasing since then. The evidence in Figures 2 and 3 suggests that absolute convergence of incomes is highly unlikely in the region but rather points to possible conditional convergence. This conditional convergence is characterized by a process whereby Botswana, Mauritius catch up with South Africa toward high levels of

income and GDP growth whereas the rest of the countries converge toward low income and low (or negative) growth rates.

5. Econometric Analysis

5.1 Empirical growth model

The econometric analysis is based on a reduced-form equation relating the growth rate of real per capita GDP to an indicator of financial development, controlling for other factors that affect economic growth. This study draws heavily from Levine (1997) in motivating the link between financial development and economic growth. Unlike standard empirical studies in economic growth (see, for example Islam 1995; Mankiw, Romer and Weil 1992), the empirical model used in this paper is not explicitly derived from a production function. Therefore, its results can not be used to make inferences on the parameters of the production function.

Following the practice in recent studies, the analysis uses a panel data approach to take into account the effects of unobservable country-specific effects (see Islam 1995; Darlauf and Quah 1998).[8] We use annual data and pooled data (5-year cross sections for 1970, 1975, 1980, 1985, 1990, and 1995) alternatively. The model is of the following form:

$$\ln y_{it} - \ln y_{i,t-T} = \alpha_i + \beta \ln y_{i,t-T} + \gamma \ln \mathrm{FIN}_{i,t-\tau} + \delta' \ln \mathbf{X}_{i,t-\tau} + u_{it} \qquad (1)$$

where y is real per capita GDP for country i at time t, T equals 1 for annual data and 5 for pooled data, α_i is the country-specific intercept, FIN is an indicator of financial development, **X** is a vector of control variables, and u is an error term assumed to be white noise. The variables FIN and the control factors are appropriately lagged to avoid

8 The work of Arellano and Bond (1991), among others, has inspired the use of panel data analysis in

possible simultaneity bias. For annual data, we include a one-year lag for each control variable (so $\tau = 1$); for pooled data, we use the 5-year average of the variables over the 5-year period preceding the year of the cross section.

A panel data approach has important merits in the analysis of growth dynamics (see Islam 1995; Berthélemy and Varoudakis 1998). In particular, this approach allows us to explicitly take into account the fact that some potentially important factors of growth are unobservable and/or unmeasurable. We accomplish this by including country-specific fixed effects in the model. In general, panel data analysis offers greater flexibility in the specification of the growth equation than single cross-country regressions and thus can potentially reduce chances of misspecification. However, there are a number of relevant issues associated with panel data analysis that researchers ought to be aware of. Durlauf and Quah (1998) offer a detailed discussion of potential shortcomings of panel data analysis in growth studies.

Due to the small size of our sample (eight countries) the standard single cross-country regression approach where the data is reduced to a single cross-section spanning the entire sample period is not applicable. Moreover, such an approach which assumes that control factors are constant over the entire time span has been criticized as being unrealistic (Islam 1995). It is more preferable to use shorter time spans. In this study, we use two sets of data. The first consists of annual observations for each country for the period from 1970 to 1995. The second consists of a set of 6 cross sections for the years 1970, 1975, 1980, 1985, 1990, and 1995. As Islam (1995: 1137) suggested, "if we think that the character of the process of getting near to the steady state remains essentially

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recent growth studies.

unchanged over the period as a whole, then considering that process in consecutive shorter time spans should reflect the same dynamics." The 5-year spans are quite appropriate for the purpose of analysis of growth dynamics. Obviously, our first method that uses annual observations is a somewhat extreme inference from Islam's proposition. The results should be interpreted with caution.

Following a standard practice in panel data econometrics, the equation (1) is estimated as a fixed-effects model. We transform the equation by taking deviations from the country means. However, because the equation includes a lagged dependent variable, it is necessary to use an instrumental approach to obtain consistent estimates (see Hsiao 1986; Anderson and Hsiao 1982, 1981). We use the second lag of the dependent variable as the instrument for the first lag and use the two-stage least squares (2SLS) procedure to obtain the coefficient estimates.

The data discussed in section 4 revealed that Botswana, Mauritius and South Africa are a differentiated set of countries based on their high income level. This resulted from both steady high growth for Botswana and Mauritius and stagnation for South Africa. We empirically test our characterization of this group as "mini-convergence club" (in the spirit of Baumol 1986) by including a dummy in the regressions which equals 1 for these three countries and 0 for the rest of the sample.

One important limitation of our model is that it does not include human capital accumulation. Growth theory suggests a positive relationship between education and economic growth (see Barro 1991). Unfortunately, we could not find reliable time series on education for SADC countries.

The indicators of financial development used in the regressions are (as percent of

GDP), credit to the private sector, the volume of credit provided by banks, and liquid liabilities of the financial system (measured by M3),[9] and an index of financial development combining these three indicators. The composite index of financial development (FINDEX) is calculated using a formula that is similar to the algorithm developed by Demirgüç-Kunt and Levine (1996). For a country *i* in year *t*,

$$FINDEX_{it} = \frac{1}{m}\sum_{j=1}^{m}\left[100*\left(\frac{F_{j,it}}{\overline{F_j}}\right)\right]$$

where F is an indicator of financial development, $\overline{F}_j$ is the sample mean of the indicator F_j, and m is the number of indicators included in the computation of the index (m = 3 in our case). All these financial indicators are positively correlated with growth (Table 5), indicating a potential positive effect of financial intermediation on growth.

The following control variables are included in the regressions:

- Inflation:

The conventional wisdom is that high inflation distorts economic activity and reduces investment in productive enterprises, which reduces economic growth. The data for SADC reveal that countries that managed to keep a relatively low level of inflation also experienced higher growth. For example, the high rates of inflation in Angola, Mozambique, Tanzania, and Zambia contrast with the stable and lower inflation rates in Botswana, Lesotho, Mauritius, Swaziland, and South Africa. The variable included in the regressions is the annual percentage change in the GDP deflator (at base 1987), lagged one year.

- Government consumption:

9 Other monetary aggregates can be used as measures of the size of the financial system. Some researchers

High government consumption can reduce economic growth in various ways, including crowding out of private investment, inflationary pressures due to monetary financing of fiscal deficits, and others. We use the lag of general government consumption as a percent of GDP to test this effect.

- Openness:

We include a measure of openness to account for the effects of international trade. Exports may positively affect growth if it increases the market for domestic products and generates foreign exchange reserves necessary to import capital goods. Imports can positively affect growth if increases in imports are associated with capital goods. However, openness also can adversely affect growth. The net effects can only be determined empirically. The variable used to test these effects is the lag of the sum of imports and exports as a percent of GDP.

- Debt service:

Like many other African countries, SADC countries have experienced a heavy burden of debt payments since the 1980s. Debt obligations slow down economic growth because they constitute a drain on national resources and a claim on the country's future wealth. High debt levels also make the future macroeconomic environment more uncertain in the eyes of investors (both domestic and international), which depresses investment and thus slows down economic growth. The variable used to test this effect is the lag of the ratio of debt service to GNP.

5.2 Regression results

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have used M2 instead of M3 for this purpose (e.g., Berthélemy and Varoudakis 1998).

We present results for both annual data and pooled cross-sections. We compare the results obtained using three regression methods: (1) standard OLS by imposing the restriction of a common intercept, (2) results with fixed effects obtained with a two-stage least squares instrumental variable procedure, and (3) regressions with a dummy for the high-income group (Botswana, Mauritius, and South Africa). We first present basic results with the various financial indicator (Tables 6, 7, and 8) and then the results with the two control variables (debt and openness) that proved to be significant (Table 9). The results where control variables are added individually to the base growth-finance equation are reported in the appendix (Tables A1-A3).

Effects of financial development indicators

The regression results reveal a positive and significant relationship between economic growth and the size of the financial sector as measured by liquid liabilities of financial institutions (M3 as a percentage of GDP). Both in annual data and pooled cross sections, liquid liabilities have a positive and significant coefficient. The estimated effects of liquid liabilities on growth are systematically stronger in regressions that use pooled cross sections. In these regressions, the explanatory power of the model is also better as indicated by a higher adjusted R^2. However, the coefficients are not significant in panel data regressions that include fixed effects (Tables 7, A2, and 9). This finding is consistent with the results in the study by Berthélemy and Varoudakis (1998), which covers a much larger sample. Berthélemy and Varoudakis posit that the relationship between financial development and economic growth is discontinuous. Specifically, these authors suggest that there is a threshold of financial development beyond which countries converge to a high-growth (stable) equilibrium and under which countries

converge to a low-growth (stable) equilibrium. Around this threshold, there is a structural break of the relationship between financial development and economic growth characterizing an intermediate (unstable) equilibrium. We do not explore this possibility explicitly, but our estimation with a dummy for high-income bears some resemblance to the approach used by Berthélemy and Varoudakis (1998).

The effects of credit to the private sector and the overall index of financial development are positive, but they are not statistically significant. Regressions with annual data produced negative but insignificant coefficients on credit provided by banks. With pooled cross sections, the coefficients are positive but insignificant.

The general conclusion is that financial development does have a positive effect on economic growth among SADC countries, especially when measured by the size of the financial system. A more liquid financial system implies more resources to finance economic activity. It is important to stress that the absence of a strong and systematic positive effect of credit indicators on economic growth in this sample does not contradict the findings of earlier studies on finance and growth (see Levine 1997). One possible explanation for our weak results is that our sample is small, and probably not diverse enough to allow enough cross-country variation. Another possible explanation is that the indicators used may not be good measures of the efficiency of the financial system. For financial development to have a positive effect on economic growth, it is necessary that the expansion of the financial system be accompanied by an increase in the flow of funds towards productive investment activities.

Unfortunately, the indicators available in our data sources are uninformative about this role of the financial system. Using a sample of Latin American countries, De

Gregorio and Guidotti (1991) found a negative correlation between economic growth and measures of credit supply. They argued that the results might be indicative of distortions in the credit supply process resulting in lax credit to unproductive enterprises, weakening the financial system. The weakness of the link between economic growth and credit indicators in our results may also reflect pervasive inefficiencies in the credit allocation mechanism. One way in which the financial sector's efficiency is enhanced is by strengthening financial sector legislation and banking system supervision. Mehran et al., (1998) lists South Africa and Botswana in Group III, which is defined as having "well-designed and effectively implemented system with supervisory authority well supported at a political level". As other countries within this group move toward this state of development, correlations between credit supply and economic growth may also become more evident. Ultimately, more disaggregated information on financial intermediation and especially on credit allocation mechanisms may be helpful in assessing the true relationship between financial development and economic growth.

The proposition by Berthélemy and Varoudakis (1998) about discontinuity in the relationship between financial development and economic growth may be another possible explanation for our weak results for some financial indicators. It may be worth exploring this possibility empirically in future work.

On convergence

The results are particularly informative with regard to patterns of convergence among SADC countries. Our test for convergence consists in examining whether the coefficient on lagged real GDP per capita is negative and significant. The OLS results systematically reject the hypothesis of convergence among SADC countries (Tables 6,

A1, 9). In contrast, convergence is confirmed systematically when a dummy for the high-income category is included in the equation (Table 8, A3, and 9). In this case, the coefficient on lagged per capita GDP is negative and significant. When country-specific fixed effects are included, convergence holds for annual data, but not for pooled cross sections (Tables 7, A2, and 9). These results confirm the findings from recent growth studies that convergence occurs only among comparable economies (conditional convergence). Botswana, Mauritius, and South Africa appear to belong to a significantly different category than the other community members. These regression results are consistent with the findings illustrated in Figure 2 about a two-tier convergence phenomenon whereby Botswana and Mauritius are "catching up" with South Africa and converging to high-income levels while the other SADC members stagnate at low-income low-growth levels. This explains why regressions that force a common intercept – thus absolute convergence – systematically reject the hypothesis of convergence.

Results for other factors of growth

Tables A1, A2, and A3 in the appendix report the regression results when other factors are included individually in regressions that include liquid liabilities as indicator of financial development (the indicator that proved significant). The results indicate a negative and significant effect of debt service on growth. This result holds all the time in regressions with annual data. The coefficient is not significant in regressions with pooled data when the high-income dummy or fixed-effects are included (Tables A2 and A3). However, the coefficient is significant in pooled data when both debt and openness are included simultaneously (Table 9). The results imply that the high debt burden experienced by SADC countries, especially since the 1980s, has been an obstacle to

economic growth.

The results indicate a positive effect of international trade on economic growth, except in regressions with pooled data with fixed effects (Table A2). One possible explanation of this positive correlation between openness and growth is that exposure to the international market increases the demand for domestic products while providing needed capital goods and technology for domestic producers. However, caution should be exercised in generalizing this result or using it as a basis for policy recommendation. A more detailed analysis would be necessary to examine the channels through which openness affects economic growth. For example, it may be informative to examine the composition of imports (distinguishing between capital goods and consumption goods) and the effects of trade on domestic prices (possible imported inflation).

The empirical results indicate a negative relationship between government consumption and economic growth. But the relationship is not significant in the regressions with pooled data. The results do not confirm the prediction of a negative effect of inflation on economic growth. The coefficients on the inflation variable are negative but insignificant. This is not surprising since the eight countries included in the regression sample experienced only moderate inflation, with the exception of Zambia.

Table 9 presents regressions results when debt service and openness, the two variables whose coefficients are generally significant, are included simultaneously. The results are generally consistent with the findings in other regressions. The positive effects of liquid liabilities on economic growth are most evident (positive and significant) in pooled data. A possible explanation for this result is that the effects of financial development are more observable in the long run. In effect, finance influences growth by

stimulating real economic activity, especially through investment and consumption. It may be difficult to observe such effects on an annual basis. This finding militates in favor of the use of longer time spans (like 5-year cross sections) rather than annual data in examining the finance-growth nexus.

The results in Table 9 confirm that international trade (openness) has a positive effect on growth while debt service is an obstacle to economic growth. Also, convergence systematically holds in regressions with a high-income dummy, whether we use annual data or pooled data. In regressions with fixed effects, convergence is observed only in annual data. The general conclusion is that there is an apparent pattern of "conditional" convergence where Botswana, Mauritius, and South Africa are converging to high income levels whereas the other countries are stagnating at low income levels.

5. Conclusion and Suggestions for Further Work

The purpose of this paper was to test the hypothesis that financial intermediation has a positive impact on economic growth by looking at countries in the regional integrated group of the Southern African Development Community (SADC). Using various indicators of financial development, we find some evidence of a positive correlation between financial development and growth of real per capita GDP. The results show a positive and significant relationship between economic growth and the size of the financial system as measured by liquid liabilities of financial institutions. This relationship is stronger in regressions that use pooled cross sections, suggesting that the finance-growth nexus is a long-run phenomenon. However, the results are less conclusive with other financial indicators, credit by banks and credit to the private sector.

One possible interpretation of these mixed results is that in this sample of

countries, aggregate indicators of financial development do not fully capture the positive effects that the expansion of financial systems has on the allocation of resources into productive activities. Alternatively, these results may be an illustration of low efficiency of the financial systems. Financial development enhances economic growth to the extent that it increases the channeling of funds to worthwhile investments, which enhances the productivity of other factors of production. The key may be the adjective "worthwhile". The quality of new investments is not observable in macroeconomic data on credit to the private sector. It is therefore likely that our results underestimate the true effects of financial intermediation on growth due to insufficient disaggregation. This implies that more disaggregated measures of financial development and sector-specific information on financial resource allocation are needed to adequately assess the true impact of financial intermediation on economic activity. Another possible explanation is that the relationship between financial development and economic growth may be discontinuous as proposed by Berthélemy and Varoudakis (1998). These explanations suggest that as the financial sector of SADC countries develop beyond some threshold, they will increase in efficiency, and the aggregate financial development variables like private credit may become more highly correlated with growth. The intra-regional cooperation in place should produce positive externalities from the more highly developed financial sectors in South Africa and Botswana to the other members of SADC.

This paper did not empirically investigate the role played by equity markets in economic growth. The statistics presented in Table 4 show flourishing capital market activities in many of the SADC countries. Seven of the thirteen bourses in existence in Africa are located within the SADC group. South Africa and Mauritius have the most

mature of these. They also share the highest per capita income. Capital markets are likely to play a major role in these economies in the future. Echoing recent evidence on the positive connections between stock markets development and economic growth (Levine and Zervos 1998, 1996), further work would be helpful to examine the exact links between securities markets and real economic activity in the SADC region.

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Table 1: Per capita GNP (current[a] US $ and % compound annual growth rate)

Country	1965	1970	1975	1980	1985	1990	1996
Angola	NA	NA	NA	NA	NA	400	270
% growth		NA	NA	NA	NA	NA	-6.34
Botswana	70	140	430	1020	1120	2490	3210[b]
% growth		14.86	25.16	18.85	1.88	17.32	5.21
Lesotho	60	100	250	440	380	550	660
% growth		10.75	20.11	11.97	-2.88	7.67	3.08
Malawi	60	60	130	190	160	200	180
% growth		0.00	16.72	7.88	-3.37	4.56	-1.74
Mauritius	NA	280	790	1240	1060	2440	3710
% growth		NA	23.05	9.43	-3.08	18.14	7.23
Mozambique	NA	NA	NA	NA	150	90	80
% growth		NA	NA	NA	NA	-9.71	-1.94
Namibia	NA	NA	NA	NA	1230	1900	2250
% growth		NA	NA	NA	NA	9.08	2.85
South Africa	530	770	1590	2490	2100	2860	3520
% growth		7.75	15.60	9.38	-3.35	6.37	3.52
Swaziland	180	230	570	910	760	1110	1210
% growth		5.02	19.90	9.81	-3.53	7.87	1.45
Tanzania	NA	NA	NA	NA	NA	190	170
% growth		NA	NA	NA	NA	NA	-1.84
Zambia	NA	440	600	630	360	530	360
% growth		NA	6.39	0.98	-10.58	8.04	-6.24
Zimbabwe	NA	330	600	760	630	690	610
% growth		NA	12.70	4.84	-3.68	1.83	-2.03

Source: World Bank, *World Development Indicators 1998.*

[a] GNP is in current US $, World Bank's Atlas method.

[b] For Botswana, GNP for 1996 is missing; the value reported here is for 1995.

NA = data not available

Table 2: Real GDP growth and inflation (5-year averages)

2.a: Compound growth rate of real per capita GDP (%)

Country	1966-71	1971-76	1976-81	1981-86	1986-91	1991-96
Angola	NA	NA	NA	NA	-0.15	-2.88
Botswana	7.06	13.58	7.26	5.97	6.69	1.50
Lesotho	1.97	6.18	4.75	-1.29	5.21	5.03
Mozambique	NA	NA	NA	NA	7.93	1.88
Mauritius	-0.72	9.54	0.09	4.61	5.39	3.96
Malawi	2.54	2.05	-0.48	-0.33	0.59	0.47
Namibia	NA	NA	NA	NA	-0.66	1.34
Swaziland	5.27	3.07	0.57	0.95	5.34	-0.46
Tanzania	NA	NA	NA	NA	NA	NA
South Africa	3.43	1.17	1.32	-2.50	-0.46	-0.10
Zambia	-0.46	0.84	-3.01	-3.76	-1.55	-3.32
Zimbabwe	NA	0.21	0.79	-1.44	0.46	-1.30
Sample[a]	2.73	4.59	1.41	0.27	2.71	0.72

2.b: Inflation rate (% compound annual growth rate of GDP deflator, base = 1987)

Country	1966-71	1971-76	1976-81	1981-86	1986-91	1991-96
Angola	NA	NA	NA	NA	28.76	1514.8
Botswana	5.24	10.99	11.45	11.63	12.13	10.07
Lesotho	0.48	10.87	11.95	12.44	12.32	10.25
Mozambique	NA	NA	NA	16.90	61.31	46.98
Mauritius	3.93	15.44	14.59	8.08	10.67	6.13
Malawi	4.64	9.38	9.67	11.41	18.04	36.33
Namibia	NA	NA	NA	13.83	10.37	9.99
Swaziland	1.45	12.68	11.92	10.26	10.06	10.61
Tanzania[b]	10.37	14.11	17.39	31.57	30.30	25.93
South Africa	4.48	13.10	14.44	15.20	14.99	10.09
Zambia	3.40	6.07	12.26	31.07	73.38	80.69
Zimbabwe	-0.20	8.41	11.08	11.10	18.01	26.00
Sample[a]	2.93	10.87	12.17	13.90	21.20	23.77

Source: World Bank, *World Development Indicators 1998*.
NA = data not available.
[a] The sample mean is for the 8 countries with complete data (excluding Angola, Mozambique, Namibia, and Tanzania)
[b] For Tanzania, the inflation rate is the average growth rate of the CPI (GDP deflator not available)

Table 3: Gross domestic investment and liquid liabilities (5-year averages

3.a Gross domestic investment (% of GDP)

Country	1966-71	1971-76	1976-81	1981-86	1986-91	1991-96
Angola	NA	NA	NA	18.17	14.42	16.37
Botswana	26.58	44.69	32.98	27.50	28.43	26.05
Lesotho	11.71	21.26	34.23	44.02	60.49	89.95
Mozambique	NA	NA	11.35	19.65	42.04	50.73
Mauritius	13.48	24.50	27.57	20.61	29.45	28.74
Malawi	17.75	26.81	27.14	17.58	18.97	15.39
Namibia	NA	NA	26.35	13.37	17.76	20.23
Swaziland	21.83	22.45	35.37	28.88	20.37	22.31
Tanzania	NA	NA	NA	NA	21.23	23.53
South Africa	28.51	29.09	26.23	23.52	18.36	16.35
Zambia	29.86	34.77	21.05	16.78	12.57	13.87
Zimbabwe	19.46	24.69	17.83	22.73	21.21	20.42
Sample[a]	21.15	28.54	27.80	25.21	26.24	29.14

3.b Liquid liabilities (M3, % of GDP)

Country	1966-71	1971-76	1976-81	1981-86	1986-91	1991-96
Angola	NA	NA	NA	NA	NA	NA
Botswana	NA	13.95	28.49	25.64	29.57	27.49
Lesotho	NA	16.32	29.07	54.48	43.66	37.57
Mozambique	NA	NA	NA	NA	45.26	43.32
Mauritius	30.37	43.17	42.58	46.01	61.74	73.75
Malawi	17.46	22.12	20.73	21.46	21.78	20.47
Namibia	NA	NA	NA	NA	25.13	35.64
Swaziland	14.23	24.30	34.08	33.23	32.97	32.75
Tanzania	NA	NA	NA	NA	21.64	26.56
South Africa	62.18	62.53	58.80	55.91	57.22	55.19
Zambia	20.43	27.74	30.51	33.35	28.69	17.09
Zimbabwe	NA	16.23	26.91	29.27	29.19	26.62
Sample[a]	31.39	29.64	33.90	37.42	38.11	36.86

Source: World Bank, *World Development Indicators 1998*.
NA = data not available.
[a] The sample mean is for the 8 countries with complete data (excluding Angola, Mozambique, Namibia, and Tanzania).

Table 4: Stock market indicators for 1996

Country	Listed companies	Market capitalization		Value of traded shares	
		(% of GDP)	% annual growth 1990-1996	Million US $	% annual growth 1990-1996
Botswana	12	7.33	1.6	12	34.8
Malawi	1	0.68	NA	0.04	NA
Mauritius	45	43.26	27.6	89	56.7
Namibia[a]	27	502.6	50.8	154	1467.3
South Africa	626	191.0	1.8	8993	22.8
Swaziland	5	45.2	67.4	2.2	66.9
Zambia	3	6.8	NA	241	NA
Zimbabwe	65	63.4	8.4	2.57	30.9

Source: SADC Finance and Investment Sector Coordinating Unit (SADC-FISCU), *1997 Southern Africa Economic Summit*, Harare, Zimbabwe, 21-23 May 1997; and *1998 Southern Africa Economic Summit*, Windhoek, Namibia, 17-19 May 1998.

[a] For Namibia, the growth rate relates to the period of 1992-1996 for market capitalization and to 1993-1996 for traded shares (1990 data not available).

Table 5: Correlation between financial indicators and growth

Annual data				
	ln (M3)	ln (private)	ln (bank)	ln (FINDEX)
ln (y)	0.593[a]	0.472[a]	0.323[a]	0.527[a]
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
ln (M3)		0.737[a]	0.460[a]	0.837[a]
		(0.0001)	(0.0001)	(0.0001)
ln (private)			0.507[a]	0.888[a]
			(0.0001)	(0.0001)
ln (bank)				0.751[a]
				(0.0001)
Pooled cross sections				
	ln (M3)	ln (private)	ln (bank)	Ln (FINDEX)
ln (y)	0.678[a]	0.522[a]	0.465[a]	0.627[a]
	(0.0001)	(0.0002)	(0.0013)	(0.0001)
ln (M3)		0.739[a]	0.472[a]	0.810[a]
		(0.0001)	(0.0001)	(0.0001)
ln (private)			0.523[a]	0.890[a]
			(0.0002)	(0.0001)
ln (bank)				0.792[a]
				(0.0001)

The p-values are given in parenthesis. The symbol [a] indicates significance at the 1% level. y is real per capita GDP, M3 is liquid liabilities of the financial system in percent of GDP, private is credit to the private sector in percent of GDP, bank is credit provided by banks in percent of GDP, FINDEX is an index of financial development combining these three financial indicators.

Table 6: OLS results: Growth and indicators of financial development

Explanatory variables	(1) with liquid liabilities	(2) with private sector credit	(3) with credit by banks	(4) with financial development index
A. Annual data				
Constant	-0.011	-0.011	-0.024	-0.026
	(-0.43)	(-0.43)	(-0.98)	(-1.06)
ln y_{t-1}	0.003	0.003	0.005	0.005
	(0.99)	(1.01)	(1.56)	(1.58)
Financial	0.052[c]	0.024	-0.005	0.033
indicator	(1.74)	(0.89)	-(0.75)	(1.04)
Adj. R^2	0.021	0.01	0.018	0.02
Observations	183	178	169	169
B. Pooled cross sections				
Constant	0.077	0.179	-0.0009	0.033
	(0.47)	(0.10)	(-0.00)	(0.19)
ln y_{t-5}	-0.0007	-0.012	0.009	0.004
	(-0.03)	(-0.51)	(0.41)	(0.19)
Financial	0.336[a]	0.148	0.039	0.151
indicator	(3.34)	(1.62)	(1.3)	(1.52)
Adj. R^2	0.197	0.020	0.050	0.011
Observations	38	38	36	36

Note: The t statistics are given in parenthesis.
The symbols [a], [b], [c] indicate statistical significance at the 1%, 5%, 10% level, respectively.
The index of financial development is computed by combining liquid liabilities, credit to the private sector, and credit provided by banks (see definition in section 4).

Table 7: Results with fixed effects: Growth and indicators of financial development

Explanatory variables	(1) with liquid liabilities	(2) with private sector credit	(3) with credit by banks	(4) with financial development index
A. Annual data				
ln y_{t-1}	-0.04[b]	-0.048[b]	-0.053[b]	-0.055[a]
	(-2.40)	(-2.52)	(-2.59)	(-2.72)
Financial indicator	0.028	0.019	-0.005	0.04
	(1.02)	(0.81)	(-0.87)	(1.43)
Adj. R^2	0.030	0.026	0.032	0.042
Observations	184	179	170	170
B. Pooled cross sections				
ln y_{t-5}	0.362	0.123	0.059	0.015
	(0.49)	(0.22)	(0.23)	(0.06)
Financial indicator	0.205	0.074	0.027	0.121[c]
	(1.11)	(1.05)	(1.13)	(1.67)
Adj. R^2	0.044	0.044	0.040	0.039
Observations	38	38	36	36

Note: The t statistics are given in parenthesis.
The symbols [a], [b], [c] indicate statistical significance at the 1%, 5%, 10% level, respectively.
The index of financial development is computed by combining liquid liabilities, credit to the private sector, and credit provided by banks (see definition in section 4).

Table 8: Results with dummy for high-income group: Growth and indicators of financial development

Explanatory variables	(1) with liquid liabilities	(2) with private sector credit	(3) with credit by banks	(4) with financial development index
A. Annual data				
Constant	0.066[b]	0.070[b]	0.057[c]	0.058[c]
	(2.07)	(2.19)	(1.85)	(1.87)
High-growth dummy	0.045[a]	0.049[a]	0.047[a]	0.048[a]
	(3.84)	(4.05)	(4.00)	(4.12)
ln y_{t-1}	-0.009[b]	-0.009[b]	-0.008[c]	-0.008[c]
	(-2.01)	(-2.14)	(1.82)	(-1.91)
Financial indicator	0.049[c]	0.023	-0.004	0.042
	(1.72)	(0.91)	(-0.69)	(1.38)
Adj. R^2	0.080	0.079	0.088	0.096
Observations	193	178	169	169
B. Pooled cross sections				
Constant	0.493[a]	0.621[a]	0.402[b]	0.434[b]
	(2.98)	(3.57)	(2.08)	(2.32)
High-growth dummy	0.262[a]	0.294[a]	0.232[a]	0.236[a]
	(4.26)	(4.50)	(3.29)	(3.42)
ln y_{t-5}	-0.068[a]	-0.086[a]	-0.055[c]	-0.060[b]
	(-2.91)	(-3.43)	(-2.00)	(-2.25)
Financial indicator	0.259[a]	0.124	0.028	0.136
	(3.07)	(1.67)	(1.07)	(1.56)
Adj. R^2	0.457	0.362	0.220	0.248
Observations	38	38	36	36

Note: The t statistics are given in parenthesis. The symbols [a], [b], [c] indicate statistical significance at the 1%, 5%, 10% level, respectively. The index of financial development is computed by combining liquid liabilities, credit to the private sector, and credit provided by banks (see definition in section 4). High-growth dummy = 1 for Botswana, Mauritius and South Africa; and 0 for the other countries.

Table 9: Results with debt service ratio and openness combined

Explanatory variables	(1) OLS results	(2) With fixed effects (LSDV)	(3) With high-growth dummy
A. Annual data			
Constant	-0.143[a]		-0.097[b]
	(-2.88)		(-2.05)
High-growth dummy			0.055[a]
			(4.88)
ln y_{t-1}	0.002	-0.072[a]	-0.013[a]
	(0.73)	(-3.61)	(-2.99)
Liquid liabilities	0.040	0.022	0.036
	(1.43)	(0.88)	(1.34)
Debt service	-0.035[a]	-0.033[a]	-0.032[a]
	(-3.63)	(-3.75)	(-3.50)
Openness	0.032[a]	0.081[a]	0.042[a]
	(3.22)	(2.65)	(4.46)
Adj. R^2	0.122	0.128	0.221
Observations	183	183	183
B. Pooled cross sections			
Constant	-0.541[c]		-0.449[c]
	(-1.80)		(-2.03)
High-growth dummy			0.325[a]
			(5.46)
ln y_{t-5}	0.004	0.038	-0.084[a]
	(0.22)	(0.12)	(-4.01)
Liquid liabilities	0.218[b]	0.091	0.172[b]
	(2.39)	(1.14)	(2.55)
Debt service	-0.070[a]	-0.093[c]	0.0027
	(-2.78)	(-1.83)	(0.12)
Openness	0.152[b]	0.291[c]	0.230[a]
	(2.60)	(1.86)	(5.08)
Adj. R^2	0.413	0.219	0.683
Observations	38	38	38

Note: The t statistics are given in parenthesis. The symbols [a], [b], [c] indicate statistical significance at the 1%, 5%, 10% level, respectively. High-growth dummy = 1 for Botswana, Mauritius and South Africa; and 0 for the other countries.

Figure 1: Average per capita GNP in 8 SADC countries (US $)

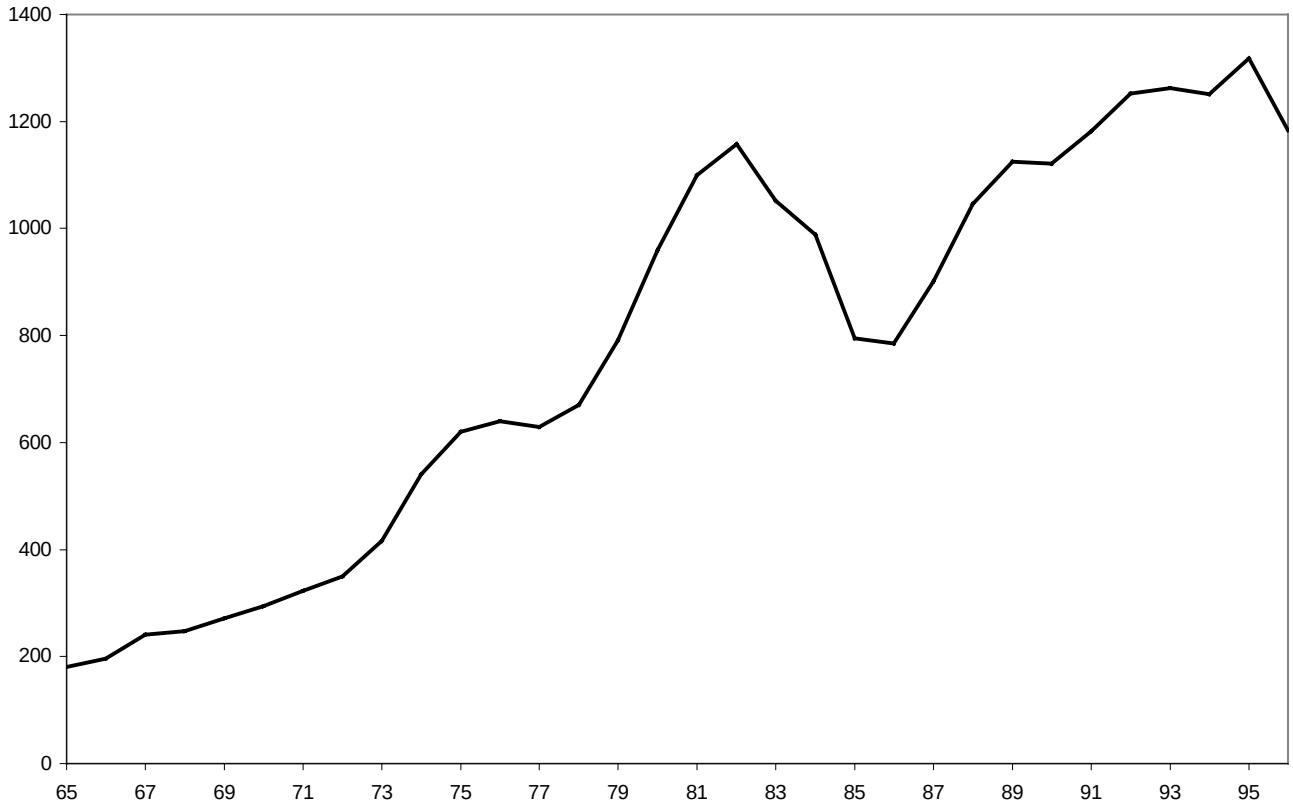


Figure 2: Relative GDP of SADC countries, 1965-1996

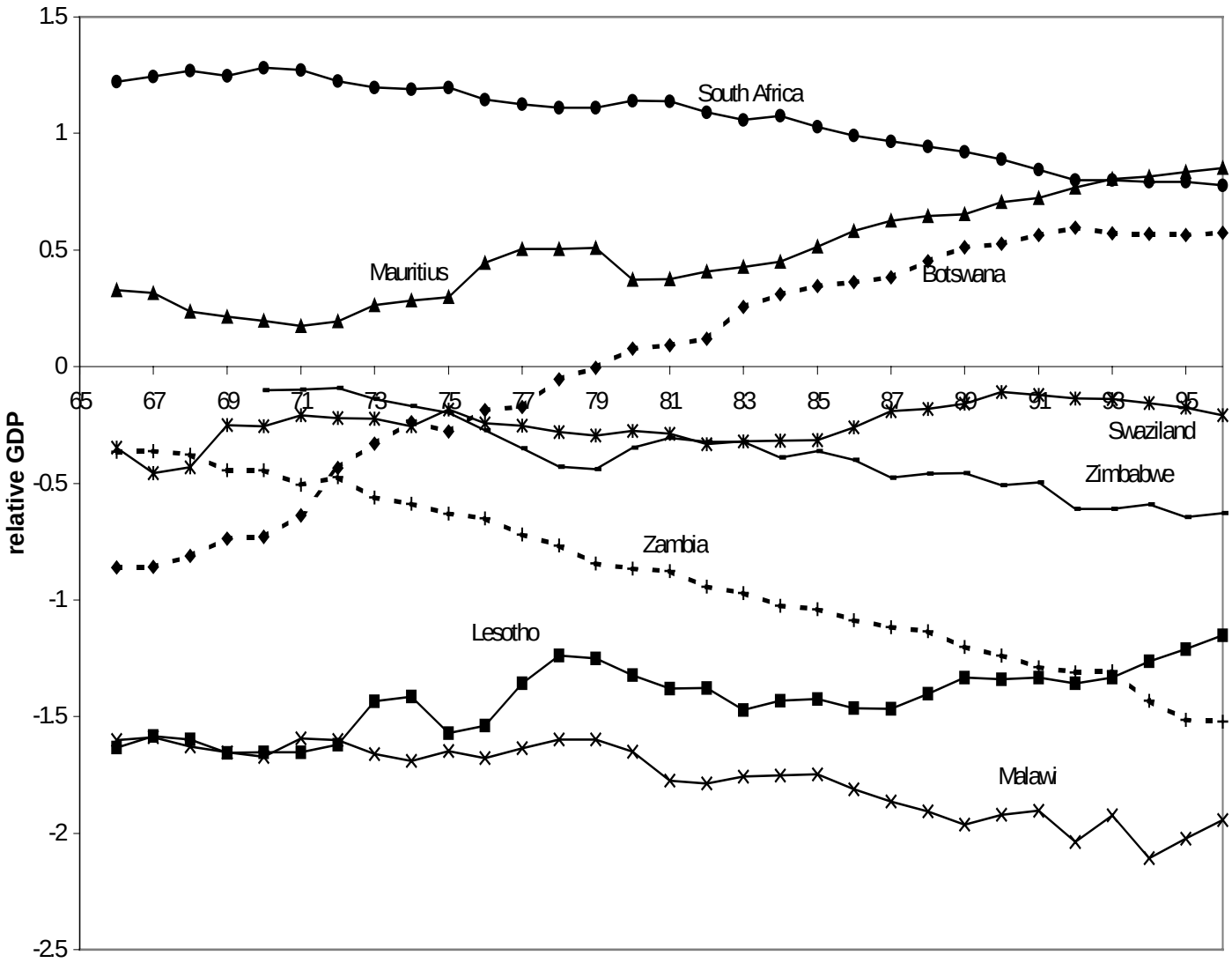
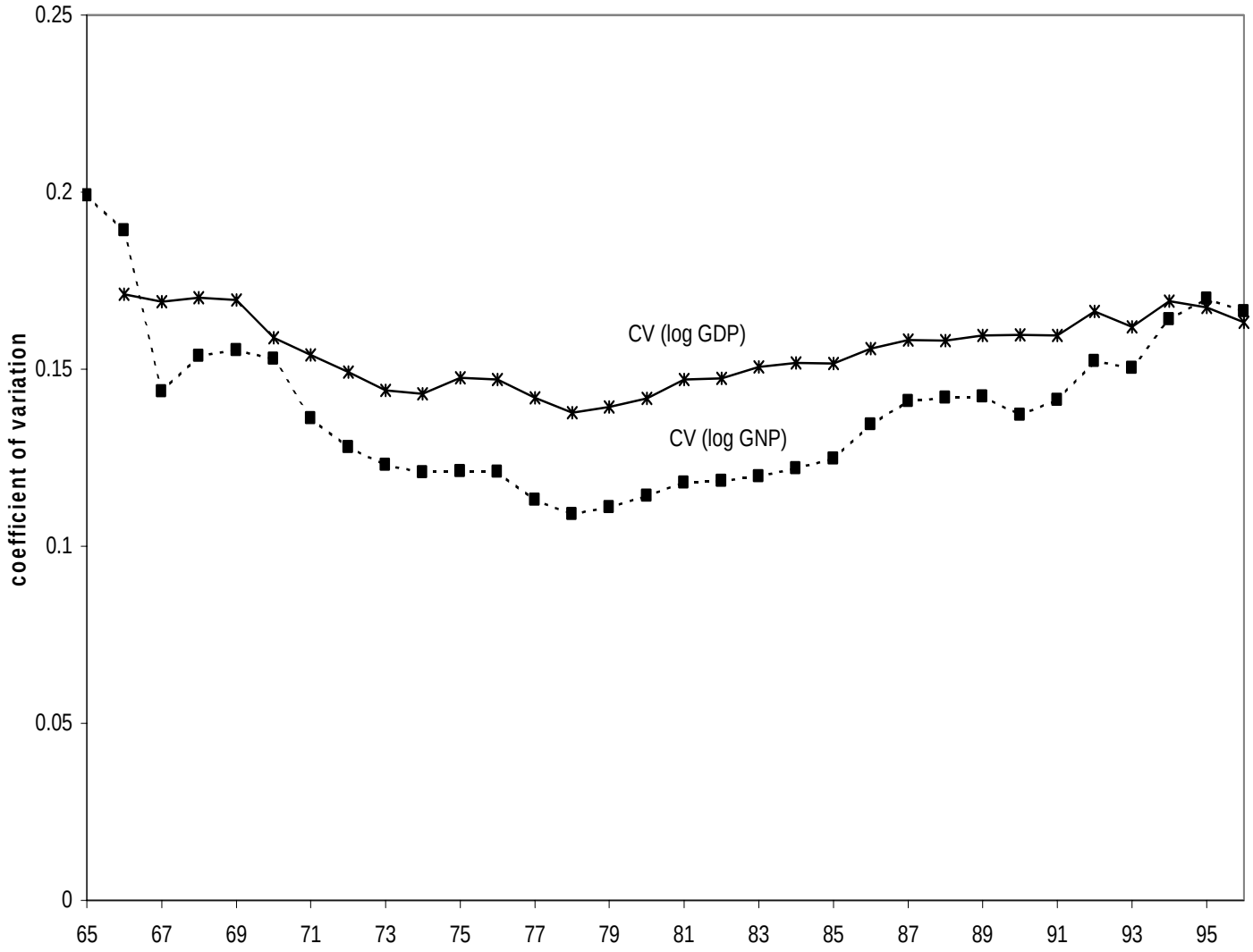


Figure 3: Dispersion of GDP and GNP among SADC countries, 1965-1996



APPENDIX

Table A1: OLS results: Effects of other factors

Explanatory variables	(1) with debt service / GNP ratio	(2) with openness ratio	(3) with government consumption	(4) with inflation
A. Annual data				
Constant	-0.003	-0.159[a]	0.204[a]	-0.002
	(-0.13)	(-3.13)	(3.12)	(-0.07)
ln y_{t-1}	0.003	0.003	-0.001	0.003
	(0.81)	(0.90)	(-0.44)	(0.95)
Liquid liabilities	0.046	0.045	0.050[c]	0.050[c]
	(1.60)	(1.55)	(1.74)	(1.66)
Control factor	-0.037[a]	0.034[a]	-0.061[a]	-0.002
	(-3.73)	(3.34)	(-3.56)	(-0.46)
Adj. R^2	0.076	0.063	0.069	0.005
Observations	183	183	183	183
B. Pooled cross sections				
Constant	0.149	-0.646[c]	0.817[c]	0.228
	(0.98)	(-1.98)	(1.70)	(1.15)
ln y_{t-5}	0.004	-0.00002	-0.017	-0.002
	(0.18)	(-0.001)	(-0.75)	(-0.08)
Liquid liabilities	0.262[b]	0.286[a]	0.328[a]	0.270[b]
	(2.72)	(2.98)	(3.34)	(2.43)
Control factor	-0.074[b]	0.160[b]	-0.208	-0.029
	(-2.69)	(2.51)	(-1.63)	(-1.31)
Adj. R^2	0.316	0.300	0.233	0.213
Observations	38	38	38	38

Note: The t statistics are given in parenthesis.
The symbols [a], [b], [c] indicate statistical significance at the 1%, 5%, 10% level, respectively.

Table A2: Results with fixed effects: Effects of other factors

Explanatory variables	(1) with debt service / GNP ratio	(2) with openness ratio	(3) with government consumption	(4) with inflation
A. Annual data				
ln y_{t-1}	-0.050[a]	-0.069[a]	-0.025	-0.041[b]
	(-2.74)	(-3.31)	(-1.29)	(-2.11)
Liquid liabilities	0.022	0.029	0.029	0.025
	(0.82)	(1.07)	(1.11)	(0.92)
Control factor	-0.034[a]	0.084[a]	-0.079[a]	-0.003
	(-3.82)	(2.67)	(-3.35)	(-0.85)
Adj. R^2	0.100	0.06	0.78	0.028
Observations	184	184	184	184
B. Pooled cross sections				
ln y_{t-5}	0.151	0.282	0.176	0.266
	(0.37)	(0.43)	(0.40)	(0.42)
Liquid liabilities	0.098	0.199	0.207	0.125
	(1.02)	(1.19)	(1.45)	(0.80)
Control factor	-0.095	0.200	-0.364	-0.025
	(-1.57)	(0.91)	(-1.19)	(-1.33)
Adj. R^2	0.116	0.071	0.041	0.016
Observations	38	38	38	38

Note: The t statistics are given in parenthesis.
The symbols [a], [b], [c] indicate statistical significance at the 1%, 5%, 10% level, respectively.

Table A3: Results with high-growth dummy: Effects of other factors

Explanatory variables	(1) with debt service ratio	(2) with openness	(3) with govt. consumption	(4) with inflation
A. Annual data				
Constant	0.069[b]	-0.110[b]	0.226[a]	0.079[b]
	(2.58)	(-2.25)	(3.52)	(2.11)
High-growth dummy	0.043[a]	0.057[a]	0.038	0.046[a]
	(3.67)	(4.98)	(3.18)	(3.86)
ln y_{t-1}	-0.009[b]	-0.013[a]	-0.011[b]	-0.009[a]
	(-2.08)	(-2.95)	(-2.43)	(-2.06)
Liquid liabilities	0.044	0.040	0.049[c]	0.047
	(1.58)	(1.46)	(1.72)	(1.61)
Control factor	-0.035[a]	0.045[a]	-0.049[a]	-0.003
	(-3.65)	(4.58)	(-2.84)	(-0.66)
Adj. R^2	0.144	0.180	0.094	0.091
Observations	169	169	169	169
B. Pooled cross sections				
Constant	0.464[b]	-0.448[b]	0.991[b]	0.576[a]
	(2.72)	(-205)	(2.46)	(3.11)
High-growth dummy	0.230[a]	0.321[a]	0.250[a]	0.254[a]
	(3.09)	(6.74)	(4.07)	(4.08)
ln y_{t-5}	-0.059[b]	-0.083[a]	-0.077[a]	-0.067[a]
	(-2.20)	(-4.61)	(-3.19)	(-2.84)
Liquid liabilities	0.246[a]	0.171[b]	0.258[a]	0.220[b]
	(2.84)	(2.60)	(3.09)	(2.37)
Control factor	-0.023	0.229[a]	-0.145	-0.018
	(-0.78)	(5.26)	(-1.35)	(-1.00)
Adj. R^2	0.451	0.692	0.469	0.457
Observations	38	38	38	38

Note: The t statistics are given in parenthesis. The symbols [a], [b], [c] indicate statistical significance at the 1%, 5%, 10% level, respectively. High-growth dummy = 1 for Botswana, Mauritius and South Africa; and 0 for the other countries.